

CLAIMS

1. An apparatus comprising:

a tuner circuit configured to generate an intermediate frequency signal having a carrier signal at a first intermediate frequency in response to a first frequency conversion applied to a radio-frequency signal modulated by an analog television signal;

an analog-to-digital circuit configured to generate a digital intermediate signal having said carrier signal at a second intermediate frequency in response to a digitization of said intermediate frequency signal; and

a converter circuit configured to generate a digital television signal representative of said analog television signal at a baseband frequency in response to a demodulation of said digital intermediate signal.

2. The apparatus according to claim 1, wherein said converter circuit further comprises:

a translation circuit configured to generate a digital baseband signal in response to a multiplication of said digital intermediate signal by a sinusoid signal; and

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a decimation circuit configured to generate said digital television signal in response to a decimation of said digital baseband signal.

3. The apparatus according to claim 2, wherein said decimation circuit comprises a decimation filter configured to decimate said digital baseband signal.

4. The apparatus according to claim 2, wherein said decimation circuit comprises:

a first decimation filter configured to generate a first signal in response to a first decimation filtering applied to said digital baseband signal;

a circuit configured to generate a second signal in response to an image scaling of said first signal by a predetermined ratio; and

a second decimation filter configured to generate said digital television signal in response to a second decimation filtering applied to said second signal.

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5. The apparatus according to claim 1, further comprising:

a detector circuit configured to generate a level signal in response to an average level of a horizontal synchronization pulse within said digital intermediate signal; and

a control circuit configured to generate a feedback signal in response to said level signal, wherein said tuner circuit is further configured to adjust an amplitude of said intermediate signal in response to said feedback signal to maintain said average level proximate a predetermined threshold.

6. The apparatus according to claim 5, further comprising:

a decimation circuit configured to generate a second level signal in response to a second average level of a second horizontal synchronization pulse within said digital television signal, wherein (i) said control circuit is further configured to generate said feedback signal in response to said second level signal and (ii) said tuner circuit is further configured to adjust said amplitude of said intermediate signal in response to said

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10 feedback signal to maintain said second average level proximate
said predetermined threshold.

7. The apparatus according to claim 6, wherein (i) said
analog-to-digital circuit is further configure to generate a
saturation signal in response to a digital conversion saturation
while generating said digital intermediate signal and (ii) said
control circuit is further configured to adjust said feedback
signal in response to said saturation signal in place of said level
signal and said second level signal.

8. The apparatus according to claim 1, wherein said
converter circuit comprises:

a phase detector circuit configured to generate an error
signal in response to a detection of a phase error and a frequency
5 error of said digital intermediate signal relative to a sinusoid
signal;

a filter circuit configured to generate a feedback signal
in response to said error signal;

an oscillator circuit configured to generate a sawtooth
10 signal in response to said feedback signal; and

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a lookup table circuit configured to generate said sinusoid signal in response to a table look-up conversion of said sawtooth signal.

9. The apparatus according to claim 8, further comprising a tracking detector circuit configured to generate an enable signal in response to a tracking of a horizontal synchronization signal within said digital intermediate signal, wherein said filter circuit is further configured to generate said feedback signal in response to said enable signal.

10. A method of demodulating a radio-frequency signal modulated by an analog television signal, the method comprising the steps of:

(A) generating an intermediate frequency signal having a carrier signal at a first intermediate frequency in response to a first frequency conversion applied to said radio-frequency signal;

(B) generating a digital intermediate signal having said carrier signal at a second intermediate frequency in response to a digitization of said intermediate frequency signal; and

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(C) generating a digital television signal representative of said analog television signal at a baseband frequency in response to demodulating said digital intermediate signal.

11. The method according to claim 10, wherein step (C) comprises the sub-steps of:

generating a digital baseband signal in response to a multiplication of said digital intermediate signal by a sinusoid signal; and

generating said digital television signal in response to a decimation of said digital baseband signal.

12. The method according to claim 11, wherein generating said digital television signal comprises the sub-step of decimation filtering said digital baseband signal.

13. The method according to claim 11, wherein generating said digital television signal comprises the sub-steps of:

generating a first signal in response to a first decimation filtering applied to said digital baseband signal;

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5 generating a second signal in response to an image
scaling of said first signal by a predetermined ratio; and
 generating said digital television signal in response to
a second decimation filtering applied to said second signal.

14. The method according to claim 10, further comprising
the steps of:

 generating a level signal in response to an average level
of a horizontal synchronization pulse within said digital
intermediate signal;

 generating a feedback signal in response to said level
signal; and

 adjusting an amplitude of said intermediate signal in
response to said feedback signal to maintain said average level
proximate a predetermined threshold.

15. The method according to claim 14, further comprising
the steps of:

 generating a second level signal in response to a second
average level of a second horizontal synchronization pulse within
said digital television signal;

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generating said feedback signal in response to said second level signal; and

adjusting said amplitude of said intermediate signal in response to said feedback signal to maintain said second average level proximate said predetermined threshold.

16. The method according to claim 15, further comprising the steps of:

generating a saturation signal in response to a digital conversion saturation while generating said digital intermediate signal; and

adjusting said feedback signal in response to said saturation signal in place of said level signal and said second level signal.

17. The method according to claim 10, further comprising the steps of:

generating an error signal in response to a detection of a phase error and a frequency error of said digital intermediate signal relative to a sinusoid signal;

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generating a feedback signal in response to said error
signal;

generating a sawtooth signal in response to said feedback
signal; and

10 generating said sinusoid signal in response to a table
look-up conversion of said sawtooth signal.

18. The method according to claim 17, further comprising
the step of generating an enable signal in response to a tracking
of a horizontal synchronization signal within said digital
intermediate signal, wherein generating said feedback signal is
further in response to said enable signal.

19. An apparatus comprising:

means for generating an intermediate frequency signal
having a carrier signal at a first intermediate frequency in
response to a first frequency conversion applied to a radio-
5 frequency signal modulated by an analog television signal;

means for generating a digital intermediate signal having
said carrier signal at a second intermediate frequency in response
to a digitization of said intermediate frequency signal; and

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10 means for generating a digital television signal
representative of said analog television signal at a baseband
frequency in response to demodulating said digital intermediate
signal.